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Development of a biosensor for the detection of bacteria by innovative electrochemical and molecular methods

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A project co-funded by the EU and Greek funds aims to develop a portable biosensor to be placed on the SEATRAC device. The SEATRAC patented from the Greek company TOBEA is an innovative device that allows autonomous access in the sea for disabled people. The aim of the biosensor is to provide microbiological information (*E coli* and *enterococci*) for seawater for disabled persons wishing to visit the beach. All information will be available through a platform. In particular, the SMART SEATRAC device will provide information for: temperature of water, air; levels of UV radiation; intensity and direction of the wind; panoramic view of the beach; free parking spaces for people with disabilities and microbiological quality of seawater (*E. coli*, *Enterococcus*). To develop the biosensor, three methods to evaluate microbiological quality will be compared. The first one will propose the use of the loop-mediated isothermal amplification because of its sensitivity, real-time response and analysis' low cost. In the second one, electrochemical responses of microorganisms will be tested via a device which evaluates the connection between the magnitude of the electrical signal and the concentration of the sample. Electrochemical techniques are characterized by sensitivity and precision. The third one is based on aptamers molecules which bind to the target position through non-covalent interactions and bind with specific targets due to electrostatic and hydrophobic interactions. The best method will be used for the biosensor prototype. It is the first time that biosensor for seawater will be developed.

Biography

Zoi Kotsiri finished her studies at the Department of Ichthyology and Aquatic Environment. She got two annual scholarships from State Scholarships Foundation. In her thesis, she studied the population dynamics of the barnacle *Chthamalus stellatus*. She pursued her postgraduate studies at Oceanography and Management of the Marine Environment, at National and Kapodistrian University of Athens. Her thesis was performed on effects of emerging contaminants on biomarkers of neurotoxicity, oxidative stress and biotransformation in mussels *Mytilus galloprovincialis*. She is a PhD student at University of Patras. She works on the development and creation of a biosensor for the detection of hepatitis A and E through innovative electrochemical and molecular methods. She applies molecular analyses for detection of viruses on water and food samples. She has announcement at international conferences